



PLANT PROTECTION BULLETIN

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FAO PLANT PROTECTION BULLETIN

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FAO Plant Protection Bulletin

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World Reporting Service on Plant Diseases and Pests

Plant Disease Situation in the United States

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Sclerotium Blight on Apple Stock in Indiana

THE diseases caused by *Sclerotium rolfsii* Sacc. on its numerous hosts are commonly called "southern blight" in the United States because of widespread distribution and importance in the southern part of the country as compared with infrequent occurrence farther north. Hosts are mostly herbaceous, woody plants only seldom being attacked, so that the report of a serious outbreak on apple nursery stock near Indianapolis in central Indiana in 1952 is unusual from the standpoint of both location and type of host.

The outbreak affected one-year-old stock in a commercial nursery. Dying trees were first noticed in late July following five weeks of unusually hot wet weather. Weekly temperatures during the five-week period from 3 June through 8 July averaged 3° to 11° F. above normal. Rainfall for the period fell largely in heavy flash rains of almost 2 inches each time, totalling 7.61 inches altogether. Trees continued dying until late September. About 10 percent of the 20,000 trees in the stand were destroyed.

Infections were scattered in the nursery rows. Roots of dying trees were killed to the soil line. Stems remained green for some time after all the leaves turned brown. Dead leaves tended to persist on twigs after the main root had been girdled by the fungus. White mycelium and sclerotia in all stages of development were found in abundance on or near affected roots.

Sclerotium rolfsii is of rare occurrence in Indiana and previously it had never been observed in this nursery.

Although, as stated, woody plants are not often reported as affected by *S. rolfsii*, apple seedling blight has been observed occasionally in Kentucky, Maryland, Virginia and Texas, all within the normal range of the fungus. Apparently, under favorable conditions apple seedlings are rather susceptible to attack.

Prevalence of Northern Leaf Blight of Maize in Wisconsin

During the first week in September 1952 it was reported that some maize (*Zea mays*) fields in Juneau County in south-central Wisconsin were drying prematurely. Investigation showed the cause to be the northern leaf blight due to *Helminthosporium turcicum* Pass.

Severely infected fields were conspicuous from the highway. Lower leaves were completely dried and typical elongated lesions had developed on even the uppermost leaves. Ears were only in the milk stage and evidently considerable damage had already occurred in these heavily infected fields. In most fields in the Juneau County area, however, the disease was much less severe and it seemed unlikely that silage quality or grain yields would be seriously affected. The heavier attacks appeared to be associated with certain hybrids.

Numerous other reports of severe damage indicated that the blight area extended from Juneau County westward to the Mississippi River, and north and northwestward. The disease was even reported from the extreme northwestern part of the State.

Elsewhere in Wisconsin northern leaf blight could be found in almost all maize

fields but not to such an extent as to attract general attention or to cause much damage.

The disease has occurred in some parts of Wisconsin during recent years, but has never been so severe or so widely distributed as in 1952.

Probable Vector of Abutilon Mosaic on *Sida* in Florida

A graft-transmissible mosaic resembling Abutilon mosaic was reported on *Sida rhombifolia* in Florida about twenty years ago. What is probably the same disease was observed in 1952 and also in 1946 and 1947 on plants of the genus *Sida* in several parts of the State. It produces a conspicuous yellow mottle, closely similar to symptoms shown by plants of *Sida* affected with mosaic in the State of São Paulo, Brazil. Studies in Brazil have shown that the Brazilian mosaic of *Sida* is identical with infectious chlorosis of Abutilon mosaic. Although variegated plants of different species of *Abutilon* are widely grown as ornamental shrubs, no evidence of natural spread has been reported in Europe or the United States. In Brazil, however, it has been demonstrated that infectious chlorosis of malvaceae is transmitted by a white fly, *Bemisia tabaci* (Genn.).

Observations on the occurrence of mosaic on *Sida* in various parts of Florida indicate

not only widespread distribution in the State but natural spread as well. Spread is probably by means of an insect vector since, although seed transmission of Abutilon mosaic has been reported, seeds of *Sida* apparently do not carry the mosaic virus in either Florida or Brazil.

Bemisia tabaci, the white-fly vector of Abutilon mosaic on *Sida* in Brazil, has not hitherto been reported in the United States, although a closely related species, *B. inconspicua* (Quaintance), does occur in Florida. In January 1952 examination of *Sida* spp. revealed the presence of one or more species of white fly on both healthy and diseased plants. Some of the specimens were considered by the U.S. Bureau of Entomology and Plant Quarantine to be identical with specimens of *B. tabaci* from São Paulo.

From this mainly circumstantial evidence it appears that Abutilon mosaic is widely distributed in Florida on species of *Sida* and that it is being spread there by the known insect vector, *Bemisia tabaci*. The discovery of the presence of *B. tabaci* in the United States is of special importance, because of the fact that this insect is the vector of a number of other viruses, none of which are known at present to occur in this country. With the vector apparently already well distributed in Florida, any one of these viruses that might be introduced could presumably become established.

A Foliar Disease of Legumes in Central America

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A foliage disease affecting many legume crops has spread in Central America. It is caused by *Chaetoseptoria wellmanii* Stev., a fungus hitherto unrecorded in other parts of the world. Since beans constitute a basic diet in Central America, the appearance of any new disease on these crops is of importance. The disease has been found in both mild and severe infections. To date, the average farmer has not recognized it as any different from other defoliating diseases, which are all generally regarded as the results of unfavorable weather. This disease may spread further and become of major importance in bean-growing regions of North and South America.

Earlier Records

In an account of the plant diseases of El Salvador, Stevenson and Wellman (5)¹ list this disease among others found on beans (*Phaseolus vulgaris*), and cowpeas (*Vigna sinensis*), in Sacocoyo and Zapitotan. Wellman (7) later reports that damage from the new disease was not very severe in El Salvador in some years, but it caused serious losses in many fields near Armenia and La Ceiba at the end of the rainy season of 1944.

In a survey of plant diseases in Guatemala, the writer (2) states that in one year beans in one locality produced poorly due to *Septoria* blight. Subsequent examination of the specimens upon which the report was based, proved that the pathogen concerned is not a true *Septoria*, but belongs to the genus *Chaetoseptoria*, the same as found in El Salvador.

Distribution and Host Range

Supplementary to the records of this disease in El Salvador and Guatemala, it is now known to have been prevalent in Honduras during 1950 and 1952. Specimens were collected by the writer on cowpeas and on the following species of *Phaseolus*: *P. coccineus*, *P. lunatus*, *P. mungo*, and *P. vulgaris*, including the black, red and white-seeded field beans. During a prolonged period of wet weather in June 1952, an entire planting was defoliated and lost.

In Costa Rica, Quiroz Calvo (3) named as hosts of the disease, *Clitoria ternatea*, *Phaseolus aureus*, *P. angulatus*, *Stizolobium cinereum*, *S. deeringianum*, *Vigna sinensis* and *Soja* sp. Quiroz Calvo states that the infected soybean plants inspected by him came from seed imported from Cuba and that the seed of most of the remaining legumes came from Venezuela. It is likely, however, that the infection in these plots came from adjacent bean or cowpea plantings. He also reports that Wellman found the disease attacking beans in Turrialba, Costa Rica.

Collections of the disease have been made in Guatemala since 1950 by F. J. Le Beau on *Phaseolus calcaratus*, *P. vulgaris*, *Cajanus indicus*, *Desmodium nicaraguensis*, and *Dolichos lablab*. He also found a related fungus, *Chaetoseptoria vignae* Tehon, producing similar symptoms on *Vigna sinensis* in Guatemala. He is proceeding to determine whether more than one species of *Chaetoseptoria* is involved on the various legumes affected.

Symptoms and Signs

The disease is typically a foliage disease of legumes and no pod or stem infection has been reported. On *Phaseolus*, leaf spots are

¹ Numbers indicate literature cited on page 84 at the end of the article.

orbicular, sometimes irregular, with a thin border of varying shades of brown, the center being dull brown to grayish white, becoming papery and often falling out. Frequently, a brown indefinite area is seen outside of the border circumscribing the spot. The average size of the spot is 10 mm. and the number of spots varies from five to ten per leaflet. On leaflets, where the number of spots is large, the size does not exceed 5 mm. but adjacent spots coalesce. Numerous minute pycnidia are visible in the ashen centers of the spots.

On *Vigna sinensis* the whitish papery spots have a border with a reddish brown tinge and are reddish below. In size the spots are similar to those on *Phaseolus* spp. They are not zonate as are the spots on *Vigna* caused by *Aschochyta pisi* Lib., nor as large; neither do they show reddish zoning with pycnidia between the zones as in the spots caused by *Aristastoma oeconomicum* (Tracy and Earle) Tehon (1) with which they might be confused. According to the description of *Chaetoseptoria vignae* published by Tehon (6), the spots are "circular, yellowish, collapsed, up to 5 mm. in diameter, distinct below." There seems to be no great difference in symptoms produced by the two species of *Chaetoseptoria* on *Vigna*, except for the yellowing of the spots observed by Tehon, which may be a varietal reaction not seen in specimens taken in Central America.

Etiology

The cause of the disease is *Chaetoseptoria wellmanii* Stev., described by Stevenson (4) from specimens collected in El Salvador on *Phaseolus vulgaris* and *Vigna sinensis* in 1943. This species is morphologically different from *C. vignae* Tehon, collected in Illinois, and described as representing a new genus related to *Septoria*, but differing in having a crown

of brown setae surrounding the ostiole of the pycnidium.

Chaetoseptoria wellmanii has larger pycnidia and longer setae than *C. vignae*. The major difference between the two species, however, is in the size of conidia which measure $18-50 \times 1.5-2.2 \mu$ for *C. vignae* and $75-160 \times 2.5-4 \mu$ for *C. wellmanii*. Measurements of the fungus collected in Honduras from five different host plants indicate that it belongs to *C. wellmanii*, with pycnidia, $135-225 \mu$ in diameter; setae, $90-225 \times 4.5-9 \mu$; conidia, $80-135 \times 4-6 \mu$. Quiroz Calvo gives conidia measurements for *C. wellmanii*, $96-150 \times 5-6 \mu$.

Control

No data are available on the control of the disease. According to Quiroz Calvo, early application of fungicides such as Bordeaux, Parzate and Basi-cop No. 2 slowed down the progress of the disease in Costa Rica. Promising results were obtained, except on cowpeas and soybeans.

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International Wheat Rust Conference

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ORGANIZED by the Department of Agriculture of Canada, an international wheat rust conference was held 5-7 January 1953, in Winnipeg, Manitoba. The 125 delegates from Canada, United States, Mexico, and Colombia, included leading scientists engaged in the study of the cereal rusts and their control.

Dr. K. W. Neatby, Director of Science Service, Department of Agriculture, opened the conference. Discussion was led by panels of specialists from the different geographic areas represented. The topics discussed and the chairmen of the respective panels were:

Stem rust - E. C. Stakman;
 Leaf rust - T. Johnson;
 Progress in breeding wheat for rust resistance - R. F. Peterson;
 Co-operative research - B. B. Bayles;
 Genetics and species building - Ruby Larson;
 Chemical control of rusts - J. G. Dickson;
 Physiology of parasitism of rusts - G. A. Ledingham;
 Other objectives - Glenn S. Smith;
 Future plans - B. B. Bayles and C. H. Goulden.

Biotypes of Stem Rust

The main purpose of the conference was to review the progress of investigations on stem rust of wheat from an international viewpoint. From time to time during the past twenty-five years Canadian and United States investigators have met to discuss their problems and exchange information. The need for enlarging the scope of these discussions so as to include investigators from other countries was emphasized by the occurrence recently in a number of wheat-growing regions of virulent new races or biotypes of the stem rust fungus, *Puccinia graminis tritici*.

In North America, the most important of these is race 15B, which became widely distributed in the major wheat-growing areas of the United States and Canada in

1950 and has since spread into Mexico. Race 15B has now become the predominant type of stem rust in North America and all commercial varieties of wheat are susceptible to it. It was in the light of this situation and of similar trends in other wheat-growing regions that the Winnipeg conference was convened.

Discussions centered around the subject of biotypes of stem rust, their origin, identification and distribution, and their bearing on the problem of breeding resistant varieties. It was reported that, in an investigation at St. Paul, Minnesota, no less than sixteen distinct entities of biotype 15B were differentiated. At the Winnipeg Laboratory two types of 15B have been recognized and similar differences in pathogenicity have appeared in races of other cereal rusts. The same situation has been encountered in other countries, notably Australia. It was agreed that the problem of identifying new biotypes presented difficulties inasmuch as the standard differential varieties are inadequate for this purpose.

Breeding for Rust Resistance

An important phase of the breeding problem is a concerted search for resistant material. The United States has assembled a large collection of wheats from many countries of the world and these are being subjected to tests for rust resistance. In view of the large amount of material that must be tested in both plant pathological and plant breeding investigations, Dr. Stakman stressed the need for increased facilities so as to enable tests to be conducted rapidly and on as large a scale as possible under different conditions of temperature, light and humidity.

Since the cereal rusts know no international boundaries, their control has become

an international problem. Arrangements have been made by the United States Department of Agriculture with Canada and several Latin American countries, including Mexico, Colombia, Peru, Chile, and Argentina, with a view to testing breeding material and new varieties in all these countries under a wide range of environmental conditions and to as many races and biotypes as possible. Part of this work is being carried out in co-operation with the Rockefeller Foundation.

The plant breeders suggested the advantages of exploiting wider crosses than formerly in order to obtain a broader basis for resistance. Such crosses raise important and complex genetic problems. A question of immediate concern to the plant breeders is the identification in parental material now being used of genes that confer resistance to rust.

In view of the uncertainty attending the production of new varieties possessing satisfactory resistance to the common races and biotypes of stem rust, renewed interest is being shown in chemical methods of rust control. Fundamental studies on the nature of rust resistance and susceptibility, about which relatively little is known, have been undertaken by plant physiologists and biochemists.

Despite present difficulties, plant breeders have varieties, in an advanced state of devel-

opment that possess a much higher degree of rust resistance than those now being grown. It is hoped that these new productions will prevent serious rust losses until such time as the enlarged program of investigations has come to fruition.

Supplementary Activities

Dr. J. G. Taggart, Deputy Minister of Agriculture for Canada, presided at a banquet for the delegates given by the Department of Agriculture in the first evening of the conference. At the banquet, Dr. Neathy outlined the history of rust research in Canada. Dr. J. G. Harrar, Deputy Director of Agriculture of the Rockefeller Foundation, presented Dr. Stakman with a gift from colleagues and former students of the latter in the United States and Canada on the eve of his retirement as Chief of the Division of Plant Pathology at the University of Minnesota. Dr. W. F. Hanna, Chief of the Division of Botany and Plant Pathology, Department of Agriculture, added special greetings on behalf of the Canadians. Dr. Stakman spoke of the problems of research in biology.

At the end of the conference delegates visited the Laboratories of Plant Pathology and Cereal Breeding, Department of Agriculture, at the University of Manitoba.

An Epidemic of Rice Bug in India

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THE epidemic of rice bug (*Leptocorisa varicornis* F.), which occurred during the last quarter of 1952 in several states in the northern, central and eastern parts of India, has proved definitely the value of plant protection work and the importance of taking adequate precautions in advance to fight any epidemic of plant pests. The great part that the Central Directorate of Plant Protection, Quarantine and Storage can contribute during such emergencies, through measures such as the coordination of control operations and the supply of pesticides and machinery, has also been demonstrated.

Damage and Infested Area

The rice bug ordinarily appears when rice plants have completed the flowering process and grains have reached the milky stage. The insect sucks the milky juice, causing a total failure of grain formation or the formation of only partially developed discolored grain. It has been recorded also in other regions in South Asia, such as Ceylon and Fiji, often seriously damaging the rice. Previous investigations made in India have established that the insect can be effectively controlled by dusting with DDT or benzene hexachloride.

The pest appeared first in the State of Madhya Pradesh in September, 1952, and was found soon after in adjoining states, spreading northward into the States of Vindhya Pradesh, Bihar and Uttar Pradesh, and eastward into the State of Orissa. All together, about 7,582,828 acres of rice were infested.

Organisation of Control Campaign

On the receipt of information regarding the widespread outbreaks of rice bug, action was taken promptly by the State Governments concerned, as well as by the Central

Government to prevent the impending disaster. Specialists from the Directorate of Plant Protection, Quarantine and Storage were deputed to the affected States to organise an effective control program. Large quantities of DDT and benzene hexachloride as well as dusting equipment were rushed to those states to meet the urgent demand. All resources at the command of the Central Government were mobilized in order to wipe out the menace as quickly as possible.

Leaflets detailing the life history of the pest and measures for controlling it were distributed among cultivators. In Madhya Pradesh a bulletin to the same effect was broadcast from the All India Radio station at Nagpur. The entire staff of the Departments of Agriculture and Revenue in affected districts were mobilised to carry out demonstrations of the control measures. Staff and students of the Agricultural College at Nagpur also toured the affected areas in Madhya Pradesh giving practical aid. In Bihar, a senior entomologist of the Directorate of Plant Protection, Quarantine and Storage and an entomologist from the United States under the assignment of the Point IV program co-operated in organizing the campaign. They had an airplane at their disposal near Gaya aerodrome, where the outbreaks were severe in contiguous areas.

Heavy Losses Prevented

As a result of these operations, and through the enthusiastic co-operation of farmers, the pest was brought under control by the end of October. It is estimated that the pest caused on an average 10 percent loss of the crop, mostly in early maturing varieties. Had prompt measures not been taken, the pest would have caused considerable havoc to the medium and late maturing varieties as well.

To meet emergencies of this type, the State Governments are taking steps to strengthen their organisations in plant protection and the Government of India is preparing to set up a central pool of plant protection machinery so that dusters and sprayers,

both power-driven and hand-operated, can be kept at suitable centres in the country and despatched to endangered zones with the least possible delay when epidemics break out.

Contents of Previous Issues

The following subjects have already been discussed in earlier issues:

Volume 1. No. 1. The desert locust situation; San José scale in Western Europe; potato blight in Chile; diseases of economic plants in Iraq; progress in plant protection in India.

Volume 1. No. 2. The plant disease situation in the United States; the locust problem in Central America and Mexico; pineapple diseases and pests in Mexico; observations on insect pests in Israel; insect problems in Nicaragua.

Volume 1. No. 3. The migratory locust in South America; the plant disease situation in the United States; two important tree borers in Israel; infestation control in rice; spiny bollworm of cotton in Iraq.

Volume 1. No. 4. Disease outbreaks on economic plants in Italy; major pests of crops in Afghanistan; fall webworm in Austria and Yugoslavia in 1952; plant diseases and insects in the United States; wheat rusts in Spain in 1952.

Volume 1. No. 5. International Plant Protection Convention: its history, objectives and present status; the plant disease situation in the United States; virus diseases of cereals in Canada; the leaf-cutting ants in Bolivia.

Outbreaks and New Records

Nicaragua

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Coffee Grasshopper

JUDGING from the relative scarcity of damage reports, injuries to coffee berries by the large, flightless, long-horned grasshopper, *Idiarthron atrispinum* (Stal), were much less numerous in 1952 than in the previous year. The crop, however, suffered from serious local losses. Application of dusts of aldrin, toxaphene, chlordane, and methyl parathion (Folidol) to trees and ground surface gave excellent control, especially when made at hatching time. This insect lays eggs in the soil, and the emerging nymphs are readily killed by organic insecticides placed directly over the oviposition sites.

Flavor tests of coffee from plots variously treated with insecticides have for the second year indicated that at least under Nicaraguan conditions benzene hexachloride may not be used on coffee plantations. Chlordane, toxaphene, aldrin and methyl parathion did not adversely affect coffee flavor, at least when used in ordinary dosages.

Cotton Insects

Leafworm, *Alabama argillacea* (Hübner), and boll weevil, *Anthonomus grandis* Bo-

heman, were abundant on cotton in 1952 but were effectively controlled by insecticides. The most serious pest was the false pink bollworm, *Sacadodes pyralis* Dyar, which is increasing in abundance and extending in area of distribution. The insecticides in general use were ineffective for controlling this insect and natural parasitization was negligible. The Minister of Agriculture and Animal Industry has obtained legislation requiring the destruction of cotton plants two weeks after harvest with an absolute deadline on 15 March. Plants must be pulled and burned or plowed under before that date, to eliminate the possibility of further growth. This legislation is welcomed as an additional aid in the control of boll weevil and leafworm.

Stem Borers of Rice

The two lepidopterous stem borers of rice encountered most frequently in 1952 were *Rupela albinella* Cram and *Haimbachia quiriguella* Schaus. The specimens were determined by Mr. H. W. Capps, of the Bureau of Entomology and Plant Quarantine in Washington, who states that this is probably the first record of *H. quiriguella* attacking a food plant.

Spain

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The following notes cover the most significant outbreaks and spread of important insect pests and diseases affecting cultivated plants in 1952 in Spain.

Beet armyworm. In early spring (March, and especially April) there was a very heavy infestation of the armyworm, *Laphygma exigua* (Hübner), in the beet fields of the lowlands of Guadalquivir River, principally in

the Provinces of Seville and Córdoba. This early attack was effectively controlled despite the fact that this insect has ordinarily 3 to 4 generations each year. During the control operations, the following locally manufactured insecticides were used: lead arsenate (30-32 percent of As_2O_5), at 1 percent; DDT emulsions (20 percent technical DDT) at 5 percent; DDT suspension at 5 percent;

II-24 (a terpene derivative) in dust and liquid form at 0.5-0.75 percent; and lindane in 0.6 percent dust.

Spiny bollworm on cotton. *Earias insulana* Boisd. is the principal cotton pest in the regions of Levante, Andalusia and central Spain. In 1952 the outbreak was of minor importance because the insect was successfully controlled by preparations of barium and sodium fluosilicates and cryolite (sodium fluoaluminate 50 percent), all applied in dust form. Organic chlorinated insecticides have been found ineffective against this insect.

Cutworm on rice. *Prodenia litura* Fabr. has been reported as a major plague since 1937 on all horticultural crops in eastern and southeastern Spain. In 1952, it caused, for the first time, some damage in the rice fields of Valencia on the eastern coast, according to the observations of Gomez-Clemente, Director of the Plant Pathology Station at Burjasot, Valencia.

Olive fly. Prevailing low temperatures and frequent thunderstorms in the spring and especially during the summer of 1952 were responsible for a very general attack of the olive fly, *Dacus oleae* Rossi: this occurred even in the Provinces of Jaén, Córdoba, Cáceres and Toledo, which are usually free from this insect.

The Spanish method of controlling *Dacus* with fly traps containing diluted solutions of ammonium phosphate has been practised widely. As was reported at the last International Congress of Olive Culture held at Seville in 1950, this has proved to be the most economical and efficient method available at present.

United States

Bureau of Entomology and Plant Quarantine,
United States Department of Agriculture

First Record of Cotton Stem Moth

The cotton stem moth, *Platyedra vilella* Zeller, has been reported for the first time from the United States. This insect was taken from hollyhock at Mineola, Long Island, New York, which is approximately

In the Province of Tarragona, 1,700,000 olive trees were protected against the fly by this technique during the 1952 campaign, which was carried out by the olive growers under the technical direction of the Provincial Agricultural Service.

San José scale. *Quadraspidiotus perniciosus* Comst., although a well-known and destructive insect in other parts of the world, causes relatively little damage in Spain because its spread has been slow. The original foci of infestation, discovered in 1933 in the fruit-growing areas of Bajo Llobregat in the Province of Barcelona, were kept under control by fumigating the trees and nursery plants as well as by winter treatments. At present it is difficult to find any important infestations even in these original foci. Nor were subsequent minor outbreaks reported in the Provinces of Lérida and Castellon of economic significance.

Undoubtedly this scale is easy to control by modern methods, and its reputedly probably dates from its destructive extension in California around 1880, when much damage and alarm were caused by the lack of effective insecticides for its control.

Downy mildew of grapevine. The grapevine mildew caused by *Plasmopara viticola* (Berk. & Curt.) Berl. & De T. was extensive and severe in 1952 in the regions of La Rioja, Catalonia, Navarre and Galicia, to which this disease is restricted.

Outbreaks were also reported in certain areas of Castile, such as La Mancha, where climatic conditions do not normally favour the development of the pathogen.

400 miles from the nearest commercially grown cotton.

Platyedra vilella is known to occur in France, Russia, the Caucasus, Transcaucasia, Iran, Iraq and Morocco. Its host plants include various species of cotton, *Gossypium* spp.; *Althaea nudiflora*; marshmallow,

Althaea officinalis; high mallow, *Malva sylvestris*; velvet treemallow, *Lavatera arborea*; and herb treemallow, *Lavatera trimestris*.

In 1932, the cotton stem moth caused serious damage to cotton in northern Persia.

In Uzbekistan, it was found abundant on wild malvaceous plants in 1936. This insect is a very close relative of the pink bollworm, *Pectinophora gossypiella* (Saund.), and holly-hock seed moth *Platyedra malvella* Hb.

Venezuela

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As recently as in 1952, Standen¹ published a host index which enumerates the plant pathogens recorded in Venezuela up to 1949. The present notes, based upon the observations and investigations made in the past few years by the writer, G. Malaguti and A. Rodriguez Landaeta, record the occurrence of a number of plant diseases hitherto unknown in the country. The host range of several parasites has been extended and in a few other cases new phases of symptoms have been observed in well established diseases.

Diseases Affecting Field Crops

Pythium Diseases. *Pythium aphanidermatum* (Edson) Fitz., a fungus with very wide host range, was found in 1950 in the experimental fields at Maracay as a cause of the stalk rot of maize, resulting in subsequent lodging of the plants. Later, this disease was observed in other regions of the country such as Mariara, El Cenizo and Turén. In the rainy season of 1952, the same pathogen was found in the experimental plantings of beans (*Phaseolus vulgaris*), causing a wet rot. Cross inoculation on maize and beans with the two isolates gave identical positive results.

Sheath blight of rice. *Rhizoctonia solani* Kühn, in addition to attacking many crops previously recorded, has been very prevalent in recent years in rice plantings causing typical lesions on leaves and leaf sheaths. Despite its common occurrence, its economic importance has not yet been determined.

Powdery mildew on cowpea. *Erysiphe polygoni* DC. which occurs commonly on beans, was observed in 1952 for the first time attacking cowpea (*Vigna sinensis*).

Stem anthracnose of bean. *Colletotrichum truncatum* (Schw.) Andrus and Moore was first observed in the experimental fields of beans at Maracay as a cause of the stem anthracnose. Its distribution and economic significance are not yet known.

Ceratostomella on sugarcane and maize. *Ceratostomella paradoxa* (de Seynes) Dade, which is known to cause a fruit rot of pineapple in Venezuela, was recently isolated from sugarcane and from maize.

Vegetable Diseases

Phytophthora diseases. *Phytophthora capsici* Leon. was found to be the causal agent of root rot and blight of peppers (*Capsicum* spp.), and fruit decay of winter squash (*Cucurbita maxima*). This fungus, in association with *P. parasitica* and other species of *Phytophthora*, also causes a zonate fruit rot of tomato.

Alternariosis. *Alternaria solani* (Ell. and Mart.) L. R. Jones and Grout., which occurs commonly in Venezuela in association with the tomato leaf spot with concentric ridges, had not been seen causing collar rot until 1952 when it was first observed in various regions in the State of Aragua. This type of attack, which produces cankers or girdles the stem, apparently causes more damage than the leaf spot phase.

Alternaria cucumerina (Ell. and Ev.) J. A. Elliott, causing target leaf spot on watermelon, was observed in the fields in the State of Carabobo in 1950.

¹ Standen, J. H. Host index of plant pathogens of Venezuela. U.S. Dept. Agr. Pl. Dis. Repr. Suppl. 212: 59-106. 1952.

Diseases Affecting Fruits and Special Crops

Phytophthora diseases. *Phytophthora parasitica* Dast., which commonly attacks citrus and eggplant in Venezuela, was found in 1951 to cause a neck rot of pineapple and it is now regarded as the most important disease of the crop.

Phytophthora cinnamomi Rands was determined in 1952 to be responsible for the rootlet rot of avocado (*Persea americana*), the most serious disease of avocado in the country.

Phytophthora palmivora Butler or a closely related form caused a blight of safflower (*Carthamus tinctorius*), resulting in severe damage in the experimental plots at Maracay.

Ceratostomella on coffee, cacao and sunn hemp. *Ceratostomella fimbriata* (Ell. and Halst.) J. A. Elliott was observed in 1951 associated with a canker of coffee, known locally as "llaga macana". This disease, however, has not assumed economic importance. The same organism also causes stem rot of sunn hemp (*Crotalaria juncea*) during the rainy season in the States of Aragua and Carabobo. It also attacks cacao producing a necrosis of the trunk and main branches

in the commercial plantings in the State of Aragua, being most severe on the plantations near the coast. The cultures of the fungus isolated from all three hosts, i.e. coffee, crotalaria, and cacao, cannot be distinguished morphologically.

Powdery mildew of papaya. *Oidium caricae* Noak. was responsible for a severe outbreak of powdery mildew on seedlings of papaya (*Carica papaya*) in 1950. The disease was later observed in commercial plantings but it was not causing much damage.

Cortical rot of Enterolobium. *Calostilbe striispora* (Ell. and Ev.) Seaver has been known in Venezuela to cause cortical rot of cacao and coral tree (*Erythrina glauca*), a shade tree grown in coffee and cacao plantations. It was recently found to attack also *Enterolobium cyclocarpum*, a fodder tree, in Choroni in the State of Aragua.

Bud rot of oil palm. *Aphelenchoides cocophilus* (Cobb) Goodey, the nematode which causes the "red ring" disease of coconut, was discovered also on oil palm (*Elais guineensis*), causing bud rot in commercial palm groves in the State of Yaracuy. The determination was made by G. Steiner of the Division of Nematology, U.S. Bureau of Plant Industry.

PLANT QUARANTINE ANNOUNCEMENTS

Algeria (France)

Decree of 22 December 1952, published in the Journal Officiel de l'Algérie, Vol. 26, No. 104, 26 December 1952, amends the Decree of 13 March 1947 regulating the importation into Algeria of living plants and parts thereof originating in or proceeding from countries contaminated by the San José scale (*Aspidiotus perniciosus*). Articles 2, 3 and 4 of the 1947 Decree are hereby annulled and replaced by the following provisions:

The importation into Algeria of living plants and parts of plants from countries where the San José scale occurs is permitted through the ports or customs houses of Algiers, Bône, Bougie, Mostaganem, Oran, Oujda and Philippeville, subject to previous authorization by the Governor-General, who will fix conditions required for entry.

Living woody or semi-woody plants and parts of plants (trees, shrubs, nursery products, cuttings, scions and layers) from Metropolitan France are allowed entry when accompanied by a phytosanitary certificate and after disinfection. The tubers, rhizomes, bulbs and roots of Gymnosperms, Pteridophytes, Bryophytes, cacti and begonias, if free from any aerial part, are exempt from disinfection.

Fresh fruits, flowers, buds, leaves, fresh branches for bouquets and ornaments, of woody or semi-woody plants from France or other countries are allowed entry, when accompanied by a phytosanitary certificate.

Shipments found to be contaminated shall be disinfected, rejected or destroyed.

The phytosanitary certificate required should conform with the form annexed to the present Decree, which is the same as the model certificate provided in the International Plant Protection Convention, but requiring a supplemental declaration to the effect that the shipment inspected is free from San José scale.

The countries which are declared to be contaminated by the San José scale are as follows: Argentina, Australia, Austria, Canada, Chile, China, France, Germany, Hawaiian Islands, Hungary, Italy, Japan, Mexico, New Zealand, Portugal, Roumania, South Africa, Switzerland, Uruguay, U.S.A., U.S.S.R., Yugoslavia.

Denmark

Notification of the Ministry of Agriculture regarding the control of black stem rust came into force on 11 February 1953. It prohibits the grow-

ing of barberry plants (species and varieties of *Berberis*) and *Mahoberberis neubertii* except in botanical gardens attached to educational institutions and in the State Plant Pathology Station. Until further notice, evergreen species other than *M. neubertii* and the following species are excepted from this prohibition if they are not grafted on *Berberis vulgaris* or on any other rust-susceptible stock:

Berberis aggregata;
B. dictyophylla;
B. parvifolia;
B. polyantha;
B. sieboldii;
B. thunbergii, including varieties.

Importation of plants or parts of plants of species the growing of which is prohibited, and seeds and grafted plants of all species is not permitted.

Barberry plants which are exempted from the prohibition may be imported with special permit from the State Plant Inspection Service.

Notification of 19 October 1951 on the same subject is hereby revoked.

French Morocco

Decree of the Director of Agriculture and Forests of 15 December 1952, published in the Bulletin Officiel No. 2095, 19 December of the same year, supplements the Decree of 1 March 1928 relative to the importation of living insects. The present Decree adds to the list of insects which are allowed entry into and transit through the French Zone of Morocco "the living larvae of *Chironomus plumosus*, commonly called blood-worm".

India

Notification No. F. 6-4/52 issued by the Ministry of Food and Agriculture on 5 January 1953, as published in the Gazette of India No. 2, 10 January of the same year, restricts the importation of the seeds of hevea rubber from countries other than those in America and the West Indies. Such seeds must be fumigated and disinfected at the ports of Bombay and Madras before release.

Rubber seeds from America and the West Indies, according to the existing regulations, can be imported only by the Director of Agriculture, Madras.

Republic of Ireland

Importation of Forest Trees (Prohibition) Order, 1952, which is similar to the one issued in Northern Ireland on the same subject, aims at preventing the introduction of diseases and pests injurious to forest trees. It prohibits the importation of *Ulmus*, *Castanea*, *Populus*, *Quercus* and certain genera of Pinaceae from any country, except Great Britain, Northern Ireland, the Channel Islands and the Isle of Man. Under special licence small lots of these plants may be introduced for experimental purposes.

The present Order supersedes the Importation of Forest Trees (Prohibition) Order 1949.

Spain

Order of 12 February 1953, concerning measures for combatting and preventing cotton pests, as published in the Boletín Oficial del Estado, Vol. 18 N° 48, provides that the importation of cotton seed into Spain from whatever source for any purpose shall require previous approval by the Phytopathological Service, in addition to the permit from the Cotton Service and the authorization by competent institutions. Besides the importer is required to provide a phytosanitary certificate and to comply with other requirements specified in the Decree of 20 June 1924.

This restriction is applicable to the Balearic Islands, the Canary Islands and Spanish Morocco.

Tunisia (France)

Decree of the Minister of Agriculture of 27 November 1952, published in the Journal Officiel Tunisien, Vol. 70, No. 99, 9 December of the same year, adds Italy, Switzerland, the German Federal Republic and the Netherlands to the list of countries where the San José scale is known to occur. Consequently, the importation of fresh and forced fruits originating in or proceeding from these countries must be accompanied by a phytosanitary certificate indicating origin and shall be subject to inspection on arrival, as prescribed in the Decree of 11 July 1932.

United Kingdom

The Importation of Forest Trees (Prohibition) Order, which came into operation on 12 November 1952, prohibits the importation of certain living forest trees into Great Britain except under and in accordance with the conditions of a licence issued by the Minister of Agriculture and Fisheries for England and Wales or the Secretary of State for Scotland, or by an inspector.

The genera *Castanea*, *Populus*, *Quercus*, and the following genera of the order Pinaceae, viz., *Abies*, *Larix*, *Picea*, *Pinus*, *Pseudotsuga*, *Sequoia*, *Thuja* and *Tsuga*, are prohibited importation from any country. The importation of the genus *Ulmus* is prohibited from any country other than any European country. In both cases, these plants from Northern Ireland, Republic of Ireland the Isle of Man or the Channel Islands are not subject to this prohibition.

A similar order, coming into operation on the same date, was issued in Northern Ireland. It, however, prohibits the importation of *Ulmus* from both European and non-European countries.

By these Orders, the Importation of Forest Trees (Prohibition) Orders of 1949 for England and Wales, for Scotland, and for Northern Ireland, are revoked.

The Importation of Plants (Amendment) Order, 1952, for England and Wales amends the form of the certificate of health provided in the Orders of 1947 and 1949 on the same subject, consequent upon the alteration by the Importation of Forest Trees (Prohibition) Order, 1952. The certificate of health which accompanies all consignments of living plants, except those consisting wholly of potatoes, landed in England or Wales from any European country should include an additional certificate to the effect that the consignment does not contain any plants of *Castanea*, *Populus*, *Quercus*, or the prohibited genera of Pinaceae, or any plant of sugar beet or mangold, except the seeds thereof. For consignments from any country outside Europe, the certificate of health should include the same statement with the addition of *Ulmus* among the plants enumerated. The certificate required for all potatoes remains the same.

This Order came into operation on 5 January 1953.

United States

The administrative instructions prescribing method of treatment of certain fruits from Mexico were amended by the Foreign Quarantine Notice published in the Federal Register, Vol. 17, No. 234, 2 December 1952. The amendment became effective 20 November 1952.

By this amendment an additional schedule of vapor-heat treatment, previously authorized for oranges only, is authorized as a condition for the issuance of permits for the importation from Mexico of commercially sound tangerines, with tight skins and free from air pockets or puffiness, and free of leaves and other debris, during the 5-month period beginning 1 November and ending the following 31 March.

NEWS AND NOTES

El Salvador and Denmark Ratify International Plant Protection Convention

The Governments of El Salvador and Denmark have ratified the International Plant Protection Convention, the instruments of ratifications being deposited with the Director-General of FAO on 12 and 13 February 1953 respectively. This brings the numbers of countries contracting to this Convention to fourteen, namely, Australia, Austria, Belgium, Cambodia, Ceylon, Chile, Denmark, the Dominican Republic, El Salvador, India, Japan, New Zealand, Spain and Sweden.

The Desert Locust Plague

The following countries were known to be infested by Desert Locust swarms or hoppers during December 1952 and January 1953:

India, Pakistan, Iran, Iraq, Jordan, Bahrein, Kuwait, Oman, Saudi Arabia, Aden Protectorates, Yemen, Sokotra Island, French Somaliland, British Somaliland, Somalia, Ethiopia, Eritrea, Kenya, Sudan, Uganda, Tanganyika, Chad Territory, French Sudan, Libya (scattered locusts) and French Niger.

During this period the locust plague has extended rapidly, notably up the Persian Gulf and through Arabia, resulting in widespread infestations through southern Iran and Iraq, northern and western Saudi Arabia and Jordan. Breeding throughout this area is now in progress or imminent and has also begun in Pakistan. Severe damage has been reported from the Yemen and Sokotra.

The situation is critical. Extensive breeding, particularly in Saudi Arabia and Iran, threatens a further dangerous expansion of the plague during the next few months.

Canadian Plant Pest and Disease Reporting Committee

In compliance with the provisions of the International Plant Protection Convention with regard to the rôle of the contracting governments in the establishment of the World Reporting Service on Plant Diseases and Pests, Canada has organized a committee, composed of representa-

tives of the agencies concerned in the Department of Agriculture. These include the Division of Botany and Plant Pathology, the Division of Entomology, the Division of Forest Biology and the Division of Plant Protection. Mr. W. N. Keenan, Chief of the Division of Plant Protection, serves as Chairman of the Committee and Mr. L. L. Reed of the same Division as its Secretary.

Through the co-ordination of the Committee, members of the staff will obtain and compile the desired information to be transmitted to FAO, under the general supervision of each Division Chief. The Committee will also solicit the cooperation of specialists engaged in research in the field of plant protection, who are associated with Provincial Departmental Services.

European Plant Protection Organisation

The Executive Committee of the European Plant Protection Organisation (EPPO) met in January and decided *inter alia* the program of the main technical meetings to be held in 1953. These include international conferences on the muskrat and fall webworm respectively, a conference on certain aspects of the biological control of insect pests of plants, and a working party on insect pests of stored foodstuffs.

The muskrat, which does serious damage to waterways and also affects agricultural crops, is spreading in Europe, and co-ordinated action by governments is called for to arrest this spread. International meetings have already been held under the auspices of EPPO. Special attention has been paid to the threat to the Netherlands, and the Belgian authorities are collaborating closely with the Dutch and intensifying control work on the Netherlands frontier. The international conference in 1953 will be held in Munich on 8 June, and there will be an opportunity to inspect German measures of controlling muskrats in the field.

The conference on the fall webworm will probably be held in Vienna in the autumn. The results of the successful 1952 campaigns in Austria and Yugoslavia against this dangerous pest have recently been published. Another recent publication is the report of the Mediterranean Plant Protection Conference, convened by EPPO in Sicily last October. Copies of either or both publications can be obtained on application to the EPPO office, 14, rue Cardinal Mercier, Paris IX.

The Mediterranean Conference discussed the progress that is being made in the investigation and control of the Mediterranean fruit fly and also agreed on a list of nine pests and diseases hitherto unknown in the Mediterranean area which would be specially dangerous if introduced. The Conference is being followed up by visits to the Mediterranean countries by representatives of EPPO. The Director-General and Technical Adviser have already visited Greece, Cyprus and Israel and it is hoped to circulate a report on this tour in the near future.

The European Information Service is developing rapidly. Governments are showing a welcome desire to co-operate; for example, by the end of January more than half the replies had been received to the request for information on the incidence and other aspects of certain important pests and diseases in 1952. The Service is integrated with the World Reporting Service of FAO, with which EPPO works in collaboration.

The annual meeting of the Council of EPPO will be held in Paris on 15 April 1953.

FAO Conference on Wheat and Barley Breeding in the Near East

The Second FAO Conference on Wheat and Barley Breeding in the Near East will be held at Dokki, Cairo, 13-18 April 1953.

At the first meeting in this series held in Istanbul in June 1952, it was recognized that the

cheapest and most effective procedure for countering the many diseases, pests and other environmental hazards to crop production in the region is through comprehensively planned breeding programs. Plans were therefore made for co-operative investigations and other forms of international action which would contribute to the progress of cereal breeding in the Near East.

As a result, a series of fifty-six co-operative uniform wheat and barley nurseries have been established in seven participating countries. Included in the nurseries are two hundred and thirty-five varieties selected on the basis of their resistance to rusts and bunt. In accordance with the recommendation of the UNESCO meeting of experts on scientific problems of cereal rusts, held in Cyprus, March 1952, a co-operative rust survey to study the incidence and development of rust epidemics, to identify the races concerned and to determine their prevalence and movement within the region from year to year, has also been initiated. Data from these investigations, which will be assembled and summarized each year in co-operation with FAO, will form the basis for future co-operative breeding programs.

At the forthcoming meeting, progress in breeding and in the establishment of the uniform nurseries will be surveyed and plans made for further co-operative investigations. It is anticipated that representatives will be present from Egypt, Iran, Iraq, Jordan, Lebanon, Pakistan, Syria, Turkey and Cyprus.

CEREAL BREEDING PROCEDURES

This recently published FAO Development Paper covers the whole field from the hybridization of the parent plants until a new variety is in commercial production. Methods of growing hybrid populations, systems of testing and recording of results, variety purification and increase of pure seed, as well as the analysis of data, are treated in detail. Various types of nurseries are described for the breeding of varieties resistant to plant diseases and insect pests, and tolerant to certain climatic factors such as frost.

Special features of the publication are the sixteen appendices which graphically illustrate planting plans, plot arrangements, the statistical progress of a cross, variety purification and other features of a cereal breeding program. The complexity involved in modern plant breeding methods and the consequent necessity of systematizing the procedures are clearly and impressively indicated. 122 pages, \$ 1.25; 6 s 3 d.

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